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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,863	12/12/2000	Kei Murayama	849-00	4384

7590 02/13/2004
Paul & Paul
2900 Two Thousand Market Street
Philadelphia, PA 19103

EXAMINER

KIBLER, VIRGINIA M

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/734,863

Applicant(s)

MURAYAMA ET AL.

Examiner

Virginia M Kibler

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment received on 11/28/03 has been entered. Claims 1 and 4 remain pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara (6,133,052) in view of Michael et al. (6,317,513) and Kyo (JP 10-32279).

Regarding claims 1 and 4, Regarding claim 1, Ichihara discloses a bump inspection apparatus for inspecting the shapes of a plurality of bumps (Col. 2, lines 52-57) each having a planar top portion (Col. 6, lines 24-27), on an inspection object, comprising an illumination optical system 17 for illuminating the top portions, an observation portion for observing the images of the top portions in a predetermined range of the inspection object (Col. 6, lines 4-14), a processor unit for analyzing the shapes of the bumps on the basis of the images of the top portions (Col. 7, lines 6-16), and the processor unit including analyzing means for analyzing the area of the planar top portion of each of the bumps Figs. 4A-4E (Col. 7, lines 16-20), and judging means for judging whether or not the area of the top portion falls within a predetermined range (Col. 7, lines 35-43). Ichihara discloses an illumination device and an observation optical

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system, but does not appear to recognize illuminating with a parallel pencil of light vertical thereto through a telecentric optical system. However, Michael et al. ("Michael") teaches that it is known to use a telecentric optical system illuminating an object with a parallel pencil of light with an observation optical system including a telecentric optical system having an optical axis thereof in conformity with that of the illumination optical system (Col. 5, lines 45-47) to inspect solder paste. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the optical system disclosed by Ichihara to include the telecentric optical system taught by Michael because it is well known in the art (Col. 5, lines 45-46). Ichihara and Michael do not appear to recognize including reflowing the solder to form substantially hemispherical shapes and shaping the bumps by a coining process. However, Kyo teaches that it is known to form bumps into substantially hemispherical shapes by reflowing the solder (Abstract, lines 1-5) and shaping the bumps into a planar shape by a coining process (Abstract, lines 7-10). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the leveling disclosed by Ichihara and Michael to include reflowing the solder to form hemispherical shapes and coining, as taught by Kyo, because it is an alternative method to ensure uniform bump heights.

Response to Arguments

4. Applicant's arguments filed 11/28/03 have been fully considered but they are not persuasive.

Summary of Applicant's Argument: Ichihara does not recite that the bumps are formed into a substantially hemispherical shape by reflowing of solder and have top portions which are

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shaped into a planar shape by a coining process, and that the top portion of all of the bumps are on the same plane. Michael is directed to an altogether different method which concerns solder paste which is screen printed on PCBs using a stencil and cannot be combined with Ichihara. Kyo does not relate to any bump inspection.

Examiner's Response: Ichihara discloses inspecting bumps that have been leveled by a leveling device so as to make the heights of the bump heads uniform (Col. 1, lines 25-41), thereby the planar top portions are on the same plane. Ichihara discloses an illumination optical system for illuminating the top portions and an observation optical system for observing the top portions (Col. 5, lines 64-67, Col. 6, lines 1-14). While Ichihara does not recognize using a parallel pencil of light vertical thereto through a telecentric optical system, it is a well-known methodology routinely implemented in inspection systems as is shown in the Michael reference. Ichihara discloses the inspection of planar top portion of bumps formed by a leveling device including the claimed inspection limitations of an illumination optical system 17 for illuminating the top portions, an observation portion for observing the images of the top portions in a predetermined range of the inspection object (Col. 6, lines 4-14), a processor unit for analyzing the shapes of the bumps on the basis of the images of the top portions (Col. 7, lines 6-16), and the processor unit including analyzing means for analyzing the area of the planar top portion of each of the bumps Figs. 4A-4E (Col. 7, lines 16-20), and judging means for judging whether or not the area of the top portion falls within a predetermined range (Col. 7, lines 35-43). Ichihara does not specify the bumps being formed into substantially hemispherical shape by reflowing the solder. However, this is not a patentable concept. Kyo teaches that it is known to form bumps

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into substantially hemispherical shapes by reflowing the solder (Abstract, lines 1-5) and shaping the bumps into a planar shape by a coining process (Abstract, lines 7-10).

Furthermore, the recitation "bumps being formed into a substantially hemispherical shape by reflowing of solder, and said top portions of said bumps being shaped into a planar shape by a coining process, and said top portions of all of said bumps of said inspection object being on the same plane" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Conclusion

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Virginia M Kibler whose telephone number is (703) 306-4072. The examiner can normally be reached on Mon-Thurs 8:00 - 5:30 and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VK

VK
2/9/04

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri